What is Claimed

1. For use with a digital television (DTV) system operable to output a packet multiplex including video packets and audio packets representing core television content for which said system is principally licensed, said system including a mixing unit to combine the core content with non-core content, the mixing unit including at least one of an IP-to-MPEG gateway and a multiplexer,

a non-core content liaison unit comprising:

a content provider (CP) interface to receive, in a machine-readable form from a content provider unit, a specification of non-core content that is to be inserted into said packet multiplex and an insertion schedule by which said non-core content is to be inserted into said packet multiplex;

a collection unit, responsive to said CP interface, to collect said non-core content by at least one of actively retrieving and reactively receiving said non-core content from a source thereof identified in said specification;

a transfer unit, responsive to said CP interface, to transfer said non-core content from said collection unit to said mixing unit according to said insertion schedule.

2. The liaison unit of claim 1, wherein said collection unit includes memory into which said collection unit is operable to store said non-core content so as to decouple, in time, the collection and the transfer of said non-core content.

3. The liaison unit of claim 1, wherein:

said content provider unit is a first content provider unit, said machine-readable form is a first machine-readable form, said specification is a first specification and said insertion schedule is a first insertion schedule;

said CP interface also is operable to receive, in a second machine-readable form from a second content provider unit, a second specification of non-core content that is to be inserted into said packet multiplex and a second insertion schedule by which said non-core content is to be inserted into said packet multiplex;

said collection unit also is operable to collect said second non-core content by at least one of actively retrieving and reactively receiving said second non-core content from a source thereof identified in said second specification;

said transfer unit also being operable to transfer said second non-core content from said collection unit to said mixing unit according to said second insertion schedule.

4. The liaison interface of claim 3, wherein each of said first machine-readable form and said second machine-readable form is compliant with a common protocol.

5. The liaison unit of claim 1, wherein said specification includes at least one of the following:

a characterization of the type of said non-core content;

a resource locator to define a location where said non-core content can be obtained by said broadcaster unit;

a transfer schedule by which said broadcaster unit is to obtain said non-core content;

an indication of whether said broadcaster unit will actively retrieve or responsively receive said non-core content from a source of said non-core content;

an indication of whether said non-core content is to be compressed by said content provider or by said liaison unit;

an indication of whether said non-core content is to be encrypted by said content provider or by said liaison unit;

an indication of whether said non-core content is to undergo forward error correction transformations by said content provider or by said liaison unit.

6. The liaison unit of claim 5, wherein said transfer schedule includes a first set of at least one time for said non-core content to be collected and a second set of at least one time for said non-core content to be transferred, said second set being different than said first set.

7. The liaison unit of claim 1, wherein said liaison unit is sufficiently robust to interpret a valid insertion schedule whenever said insertion schedule is defined in terms of each of the following scheduling parameters taken alone or in combination:

a start time of a time slot during which an item can be output from said mixing unit;

an end time for said time slot;

a duration (D) of said time slot;

a time interval (INT) between successive outputs of said item from said mixing unit during said time slot;

a number (N) of times that said item is to be output from said mixing unit during a time slot;

a size (S) of said item; and

a bitrate (BTR) at which said item is to be output from said mixing unit.

8. The non-core content provider unit of claim 7, wherein

said insertion schedule is a microschedule;

wherein said CP interface is operable to receive a macroschedule including at least one recurring time slot, each recurring slot having a microschedule, respectively; and

wherein said transfer unit is responsive to said macroschedule.

9. The liaison unit of claim 7, wherein, if two or more of said scheduling parameters are contradictory, then said liaison unit is operable to apply at least one conflict resolution rule to ignore at least one of the contradictory scheduling parameters in order to interpret said insertion schedule to be valid.

10. The liaison unit of claim 9, wherein said at least one conflict resolution rule includes at least one of the rules from the following Rule Table:

Rule Table

Parameters Specified				Rule
INT	BTR	D	N	
Y	Y	Y	Y	If INT < S/BTR, set INT = S/BTR Ignore N, Output at INT using BTR, for D (timed),
Y	Y	Y	N	If INT < S/BTR, set INT = S/BTR Output at INT using BTR, for D (timed),
Y	Y	N	Y	If INT < S/BTR, set INT = S/BTR Output at INT using BTR, N times (timed),
Y	Y	N	N	If INT < S/BTR, set INT = S/BTR Output at INT using BTR, indefinitely (timed),
Y	N	Y	Y	Set BTR = account BTR, If INT < S/BTR, set INT = S/BTR Ignore N, Output at INT using BTR, for D (timed),
Y	N	Y	N	Set BTR = account BTR, If INT < S/BTR, set INT = S/BTR Output at INT using BTR, for D (timed),
Y	N	N	Y	Set BTR = account BTR, If INT < S/BTR, set INT = S/BTR Output at INT using BTR, N times (timed),
Y	N	N	N	Set BTR = account BTR, If INT < S/BTR, set INT = S/BTR Output at INT using BTR, indefinitely (timed),
N	Y	Y	Y	Set INT = D/N, If INT < S/BTR, set INT = S/BTR Output at INT using BTR, for D (timed),

Parameters Specified				Rule
INT	BTR	D	N	
N	Y	Y	N	Set INT = S/BTR, Output at INT using BTR, for D (timed),
N	Y	N	Y	Set INT = S/BTR, Output at INT using BTR, N times (timed),
N	Y	N	N	Set INT = S/BTR, Output at INT using BTR, indefinitely (timed),
N	N	Y	Y	Set BTR = account BTR, Set INT = D/N, If INT < S/BTR, set INT = S/BTR Output at INT using BTR, for D,
N	N	Y	N	Output for D (non-timed),
N	N	N	Y	Output N times (non-timed),
N	N	N	N	Output indefinitely (non-timed).

11. The liaison unit of claim 1, wherein said machine readable form includes representation of said specification and said insertion schedule as at least one XML document.

12. The liaison unit of claim 1, wherein:

said specification includes at least one of each of the following data structures: an account; a catalog; a group of related items; and an independent item;

wherein said data structures are organized according to the following hierarchy:

an account at the top of said hierarchy;

each account including at least one catalog;

each catalog including at least one of

an independent item to be output by said mixing unit and

a group of related items to be output by said mixing unit; and

each group including at least two of the following:

a group of related items and

an independent item.

13. The liaison unit of claim 12, wherein an attribute of a higher level data structure in said hierarchy is inherited down to a corresponding data structure at a lower level of said hierarchy by default unless a value of said attribute is separately specified at said lower level.

14. The liaison unit of claim 1, wherein:

said specification and insertion schedule are associated with an account; and

said transfer unit is operable to limit the insertion-schedule-dictated transference of said non-core content so as to comply with a bandwidth allocation for said account.

15. The liaison unit of claim 14,

wherein said transfer unit limits said transference by processing said insertion schedule as a plurality of incremental time slices, said bandwidth allocation representing a maximum data amount of data that can be transferred in each time slice, respectively; and

wherein, if transference of said maximum amount of data takes place before the end of a time slice, then said transfer unit is operable to suspend the transference until a next time slice begins.

16. For use with a digital television (DTV) system operable to output a packet multiplex including video packets and audio packets representing core television content for which said system is principally licensed, said system including a mixing unit to combine the core content with non-core content, the mixing unit including at least one of an IP-to-MPEG gateway and a multiplexer,

a non-core content provider unit comprising:

an insertion schedule generator to generate an insertion schedule; and

an interface to said DTV system to provide, in a machine-readable form, a specification of non-core content that is to be inserted into said packet multiplex and an insertion schedule by which said non-core content is to be inserted into said packet multiplex.

17. The non-core content provider unit of claim 16, further comprising a source of said non-core content.

18. The non-core content provider unit of claim 16, wherein

said DTV system is a first DTV system, said machine-readable form is a first machine-readable form, said specification is a first specification, said packet multiplex is a first packet multiplex and said insertion schedule is a first insertion schedule; and

said non-core content provider unit is operable provide to a second DTV system, in a second machine-readable form, a second specification of second non-core content that is to be inserted into a second packet multiplex and a second insertion schedule by which said second non-core content is to be inserted into said second packet multiplex.

19. The liaison interface of claim 18, wherein each of said first machine-readable form and said second machine-readable form is compliant with a common protocol.

20. The liaison unit of claim 16, wherein said specification includes at least one of the following:

a characterization of the type of said non-core content;

a resource locator to define a location where said non-core content can be obtained by said broadcaster unit;

a transfer schedule by which said broadcaster unit is to obtain said non-core content;

an indication of whether said broadcaster unit will actively retrieve or responsively receive said non-core content from a source of said non-core content;

an indication of whether said non-core content is to be compressed by a content provider or by said liaison unit;

an indication of whether said non-core content is to be encrypted by said content provider or by said liaison unit;

an indication of whether said non-core content is to undergo forward error correction transformations by said content provider or by said liaison unit.

21. The liaison unit of claim 20, wherein said transfer schedule includes a first set of at least one time for said non-core content to be collected by said DTV system and a second set of at

least one time for said non-core content to be output by said DTV system, said second set being different than said first set.

22. The non-core content provider unit of claim 16, wherein

said machine-readable form is a first machine-readable form, said specification is a first specification and said insertion schedule is a first insertion schedule, said first specification and said first insertion schedule corresponding to a first account maintained by said non-core content provider, said first account being bounded by a first bandwidth allocation; and

said non-core content provider unit is operable to provide, to said DTV system in a second machine-readable form, a second specification of second non-core content that is to be inserted into said packet multiplex and a second insertion schedule by which said second non-core content is to be inserted into said packet multiplex, said second specification and said second insertion schedule corresponding to a second account maintained by said non-core content provider, said second account being bounded by a second bandwidth allocation different than said first bandwidth allocation.

23. The non-core content provider unit of claim 16, wherein said insertion schedule generator is sufficiently robust to generate a valid insertion schedule in terms of each of the following scheduling parameters taken alone or in combination:

a start time of a time slot during which an item can be output from said mixing unit;

an end time for said time slot;

a duration of said time slot;

a time interval between successive outputs of said item from said mixing unit during said time slot;

a number of times that said item is to be output from said mixing unit during a time slot;

a size of said item; and

a bitrate at which said item is to be output from said mixing unit.

24. The non-core content provider unit of claim 23, wherein

said insertion schedule is a microschedule, and

wherein said insertion schedule generator is operable to provide a macroschedule including at least one recurring time slot, each recurring slot having a microschedule, respectively.

25. The non-core content provider unit of claim 16, wherein said machine readable form includes representation of said specification and said insertion schedule as at least one XML document.

26. The non-core content provider unit of claim 16, wherein:

said specification includes at least one of each of the following data structures: an account; a catalog; a group of related items; and an independent item;

wherein said data structures are organized according to the following hierarchy:

an account at the top of said hierarchy;

each account including at least one catalog;

each catalog including at least one of

an independent item to be output by said mixing unit and

a group of related items to be output by said mixing unit; and

each group including at least two of the following:

a group of related items and

an independent item.

27. The non-core content provider unit of claim 16, wherein an attribute of a higher level data structure in said hierarchy is inherited down to a corresponding data structure at a lower level of said hierarchy by default unless a value of said attribute is separately specified at said lower level.

28. For use with a digital television (DTV) system operable to output a packet multiplex including video packets and audio packets representing core television content for which said system is principally licensed, said system including a mixing unit to combine the core content with non-core content, the mixing unit including at least one of an IP-to-MPEG gateway and a multiplexer,

a non-core content liaison unit comprising:

a content provider (CP) interface to receive, in a first machine-readable form from a content provider unit, a request for bandwidth for insertion of said non-core content into said mixing unit, said request including a bandwidth profile of bitrate versus time or equivalent thereto;

a user interface by which to present said request to, and receive a decision concerning said request from, a user;

said CP interface being able to communicate, in a second machine-readable form to said content provider, a response to said request corresponding to said decision.

29. The liaison unit of claim 28, wherein:

said insertion schedule is a first insertion schedule; and

said response is a counter-proposal for bandwidth including a second bandwidth profile different than said first bandwidth profile.

30. For use with a digital television (DTV) system operable to output a packet multiplex including video packets and audio packets representing core television content for which said system is principally licensed, said system including a mixing unit to combine the core content with non-core content, the mixing unit including at least one of an IP-to-MPEG gateway and a multiplexer,

a non-core content provider unit comprising:

a bandwidth request generator to generate a request for bandwidth for insertion of said non-core content into said mixing unit, said request including a bandwidth profile of bitrate versus time or equivalent thereto; and

an negotiation interface to said DTV system to provide, in a machine-readable form, said bandwidth request.

31. The non-core content provider unit of claim 30, further comprising:

a user interface by which to receive at least one user criterion concerning a desired bandwidth allocation;

wherein said bandwidth request generator is operable to generate said bandwidth request in response to said user interface.

32. The non-core content provider unit of claim 30, wherein said negotiation interface is operable to receive, in a second machine-readable form, a response to said request corresponding to said decision.

33. For use with a digital television (DTV) system operable to output a packet multiplex including video packets and audio packets representing core television content for which said system is principally licensed, said system including a mixing unit to combine the core content with non-core content, the mixing unit including at least one of an IP-to-MPEG gateway and a multiplexer, a data structure of said packet multiplex comprising:

video packets and audio packets representing core television content;

non-core packets representing said non-core content;

specification packets representing a specification of said non-core content and an insertion schedule by which said non-core content is inserted into said packet multiplex.

34. For use with a digital television (DTV) system operable to output a core packet multiplex including video packets and audio packets representing core television content for which said system is principally licensed, said system including a mixing unit to combine the core content with non-core content, the mixing unit including at least one of an IP-to-MPEG gateway and a multiplexer,

a method of forming an enhanced packet multiplex comprising:

combining packets to form an enhanced packet multiplex, the combined packets including said video and audio packets representing said core television content and packets representing

said non-core content,

a specification of said non-core content, and

an insertion schedule by which said non-core content is inserted into said packet multiplex; and

outputting said enhanced packet multiplex to a DTV content receiving unit.

35. A method as embodied in elements which form the non-core content liaison unit of claim 1.

36. A computer-readable medium having embodied thereon a program to cause a processor to implement the non-core content liaison unit of claim 1.

37. A method as embodied in elements which form the non-core content provider unit of claim 16.

38. A computer-readable medium having embodied thereon a program to cause a processor to implement the non-core content provider unit of claim 16.

39. A method as embodied in elements which form the non-core content liaison unit of claim 28.

40. A computer-readable medium having embodied thereon a program to cause a processor to implement the non-core content liaison unit of claim 28.

41. A method as embodied in elements which form the non-core content provider unit of claim 30.

42. A computer-readable medium having embodied thereon a program to cause a processor to implement the non-core content provider unit of claim 30.

43. A computer-readable medium having embodied thereon a program to cause a processor to implement the method of claim 34.